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Radial-velocity curves and theoretical spectral-line profiles of the components of low-mass close X-ray binary systems

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Abstract

We present the results of calculations of theoretical absorption-line profiles and radial-velocity curves for optical components in X-ray binary systems. Tidal distortion of the optical star and X-ray heating by incident radiation from the relativistic object are taken into account. An emission component forms whose intensity varies with orbital phase in the absorption-line profile in the presence of significant X-ray heating. As a result, the width of the line decreases rather than increases at quadrature. The line profiles and equivalent widths and the radial-velocity curves depend substantially on the parameters of the binary systems. This provides the possibility of directly determining component masses and orbital inclinations from high-resolution spectroscopic observations of X-ray binary systems. © 2005 Pleiades Publishing, Inc.

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